

SIX NEW SPECIES OF TENAGOBIA BERGROTH
(HEMIPTERA, CORIXIDAE).

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In working over the *Tenagobia* material in the University of Kansas Entomological collection, the writer found six species, whose descriptions follow, which are new to science.

Tenagobia minuta sp. nov. (Pl. I, figs. 1, 4, 10, 14.)

Size: Length, male 1.8 mm.; female 1.8–2.0 mm. Width of head, male 0.75.; female 0.78 mm.

Color: Above brownish yellow, marked with indistinct fuscous irrorations; eyes darker, sometimes crossed with light bands; front transparent yellowish grey with dark irrorations; scutellum sometimes with indistinct, broken, longitudinal reddish stripes; costal margins of hemelytra each bearing three fuscous maculations. Underside of thorax and legs uniformly yellowish grey; abdomen darker, sometimes fuscous.

Structural characteristics: *Head*: Posterior margin of vertex with median tubercle, caudo-lateral angles but little produced laterally; an eye about $\frac{3}{4}$ as wide as interocular space; posterior margin of eyes approximate the posterior margin of head. *Prothorax*: No moustache-like bristles on lateral margins, cephalic aspect; pronotum 5 times wider than its median length, $2\frac{1}{2}$ times wider than posterior margin of vertex, 2 times wider than base of scutellum, anterior margin angulate, posterior margin truncate in front of bases of hemelytra and concavely arcuate in front of scutellum. *Scutellum*: Relatively large, approximately twice as long as median length of pronotum, $1\frac{1}{4}$ times wider than long, apex very acutely angled. *Hemelytra*: Exceed abdomen about 0.2 mm. in male, slightly in female; membranous suture distinct in left hemelytron but not in right; minute peg-like setae scattered irregularly over hemelytra, more on posterior half of right, distinct longitudinal impression along each costal margin. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum, and from apex of scutellum to apex of clavus is as 22: 21: 40: 70. *Wings*: present. *Abdomen*: 5th segment with one spine-like seta on either side; 6th segment with 2 spine-like setae on either side; 7th segment with 4 spine-like setae on either side, a circular patch of minute setae in dextrocephalic angle of tergum; 8th segment with 3 lateral and 1

terminal spine-like setae on either side, the tergite-tongue with 12 hair-like setae, the right half of segment with a hump-like projection on mesal margin near caudal end which bears a tuft of short bristle-like setae. *Claspers*: The left with a membranous, club-shaped, weak distal end beset with papillae, the basal and connective parts much stronger; the right the same texture throughout, apex pointed, the dorsal margin flattened in front of the apex and then curves down to join the base, 5 short spinelike setae on right side. *Legs*: Front, with 2 spine-like setae on inner underneath side of femur, tarsus proportionately large, as long as tibia, 13 bristle-like setae on lower edge, setae of inner row, except terminal ones, very minute, 5 long hair-like setae in upper row; tarsal-claw large, disc-shaped, constricted into neck at base. Middle, ratio of lengths of femur, tibia, tarsus and tarsal claws is as 32: 12: 15: 11.

Described from a series of 4 males and 3 females bearing the label: Boquerón river, Panamá, May, 1907. August Busck.

The Boquerón river is an inland stream east of the Canal Zone. It flows into the Pequeni river which in turn empties into Rio Chagres.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: *T. minuta* is the smallest of the known species of *Tenagobia*. It belongs to the group which has the pronotum truncate in front of the bases of the hemelytra. Four species compose this group at present; *marmorata* Bergroth, *pulchra* Hungerford, *minuta* sp. nov. and *truncata* sp. nov. *T. minuta* can be distinguished from *marmorata* by the fact that the scutellum is twice as long as the pronotum instead of "little longer." It can be distinguished from *pulchra* by the shape of the claspers and the tergite-tongue of the 8th abdominal segment, and by the fore-tarsus in *pulchra* being shorter than the tibia. The distinguishing characteristic of *T. truncata* sp. nov. will be given under the discussion of that species.

***Tenagobia truncata* sp. nov.** (Pl. I, figs. 5, 7, 8, 11.)

Size: Length, male 2.17 mm.; female 2.3 mm. Width across head, male 0.8 mm.; female 0.9 mm.

Color: Uniformly brownish to fuscous above; front lighter; no maculations on lateral margins of hemelytra; bases of clavi lighter; scutellum sometimes with lighter longitudinal lines. Venter fuscous; legs uniformly greyish yellow.

Structural characteristics: *Head:* Posterior margin of vertex with minute median tubercle, caudo-lateral angles but little produced laterally; an eye about $4/5$ as wide as interocular space; posterior margin of eyes narrowly separated from the posterior margin of head. *Prothorax:* No moustache-like bristles on lateral margins, cephalic aspect; pronotum 5 times wider than median length, maximum width a little more than base of head, nearly 3 times wider than posterior margin of vertex, $2\frac{1}{2}$ times wider than base of scutellum, anterior margin angulate, posterior margin truncate in front of bases of hemelytra and concavely arcuate in front of scutellum. *Scutellum:* Approximately twice as long as median length of pronotum, about $1\frac{1}{6}$ times wider than long, apex very acutely angled. *Hemelytra:* Exceeds abdomen about 0.2 mm. in male, slightly in female; membranous suture distinct in left hemelytron but not in right; minute peg-like setae scattered irregularly over the hemelytra, rather numerous along the lateral margins. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum, and from apex of scutellum to apex of clavus is as 28:28:55:80. *Wings:* Present. *Abdomen:* 5th segment with 3 short spine-like setae on either side; 6th segment with 4 short spine-like setae on either side; 7th segment with 4 short spine-like setae on either side, circular patch of minute setae in dextro-cephalic angle of tergum as in *minuta*; 8th segment with 3 lateral and 1 terminal short spine-like setae. *Claspers:* the left membranous and spoon-shaped distally (the drawing is of the lateral aspect), the basal and connective parts much stronger; the right resembles that of *minuta*, the 6 minute spine-like setae are more distad than in *minuta*, it differs in shape in that it tapers gradually from the apex to the base dorsally. *Legs:* Front rather slender, femur with two spines on inner underneath side, tarsus noticeably shorter than tibia, 14 bristle-like setae on lower edge, 11 hairs in inner row, 4 long hair-like setae in upper row; tarsal claw large. Ratio of lengths of femur, tibia, tarsus and tarsal claws of middle leg is as 32:10:15:9.

Described from a series of 2 males and 4 females bearing the label: F. X. Williams, Tena, near Oriente, Ecuador, March 29-April 10, 1923.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: This species as the preceding belongs to the group with the pronotum truncate in front of the bases of the hemelytra. It is distinguished from *marmorata* Bergroth in that

the scutellum is twice as long as the pronotum instead of "little longer." It differs from *minuta* in the shape of claspers, in that the 5th abdominal segment bears 3 short spine-like setae on either side while in *minuta* it bears only one, 6th abdominal segment in *truncata* bears 4 short spine-like setae, in *minuta* two, fore-tarsus in *truncata* shorter than tibia, in *minuta* the fore-tarsus is as long as tibia, the eighth abdominal segment in *truncata* is proportionally much smaller than in *minuta*. *T. truncata* can be distinguished from *pulchra* by the shape of the claspers and the tergite-tongue, and in the fact that *pulchra* has no circular patch of minute setae in the dextro-cephalic angle of the 7th abdominal tergum.

Tenagobia mexicana sp. nov. (Pl. I, figs, 2, 3, 12, 13.)

Size: Length, male 2.55-2.7 mm.; female 2.85-3.0 mm.

Width of head, male 0.97-1. mm.; female 1.12-1.17 mm.

Color: Brownish fuscous above; front and vertex usually yellowish transparent; lateral margins of hemelytra each with 4 dark maculations, transparent V-shaped figure near base of each clavus, slender longitudinal transparent line in right hemelytron caudad to claval suture. Venter yellowish, base of abdomen a little darker; legs and antennae yellowish.

Structural characteristics: *Head*: Posterior margin of vertex with a minute median tubercle, caudo-lateral angles produced laterally; an eye $\frac{4}{5}$ as wide as interocular space; distinct, though narrow, space between the posterior margin of the eyes and posterior margin of head. *Prothorax*: No moustache-like bristles on lateral margins, cephalic aspect; pronotum 6 times wider than median length, $2\frac{1}{2}$ times wider than posterior margin of vertex, about $\frac{1}{10}$ times wider than base of scutellum, posterior margin not truncate in front of bases of hemelytra, narrowed at ends. *Scutellum*: 3 times longer than median length of pronotum, $\frac{1}{3}$ times wider than long. *Hemelytra*: Exceeds abdomen about 0.3 mm. in male, slightly in female; membranal suture distinct in left hemelytron, but not in right; minute peg-like setae scattered over the outer half of corium, those on lateral margins arranged in a row. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum, and from apex of scutellum to apex of clavus is as 2:2:6:11. *Wings*: Present. *Abdomen*: 5th, 6th, and 7th segments each with 2 short spine-like setae on either side; 8th segment with 1 terminal and 3 lateral spine-like setae on either side, the tergite-tongue with a few very weak hair-like setae, the right half of segment with a hump-like projection on mesal margin near caudal end which bears

a tuft of short bristles. *Claspers*: The right not serrate ventrally, heel acute, but little produced, slight excavation anterior to it on ventral margin, caudal margin deeply excavated, toe much produced and rounded at apex; the left very striking, caudal part somewhat hammer shaped, the heel much produced, the toe acutely angled and much produced. *Legs*: Front, femur with a stiff spur which arises from a papilla-like projection on lower side, above this on inner side is a row of 4 spine-like setae; tarsus shorter than tibia, 14-15 bristle-like setae in lower row, 15-17 hairs in inner row, 8 long hair-like setae in upper row. Ratio of lengths of femur, tibia, tarsus, and tarsal claws of middle leg is as 13:4:5:4.2.

Described from a long series of males and females (about 250) which bear the label: House of General Obregón, Naimari, Sonora, Mexico, Aug. 8, 1927. Taken at light. A. Dampf.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: This species, as well as the following one, *serrata* sp. nov., belongs to the *signata* (White) group. This group of *Tenagobia* is characterized by having a large spur on the ventral side of the fore-femur. Up to the present three species, *signata* and *socialis* (White), and *incerta* Lundblad, have composed this group. To these the writer adds *mexicana* and *serrata* sp. nov. These five species are very close to each other and can be separately definitely only by examining the genital claspers of the males. Fortunately the shape of the claspers is constant within the species as well as being characteristic of the species. Among the other characters which enable one to differentiate among these species is the number of hair-like setae in the upper row of the fore-tarsus and the bristle-like setae in the lower row. *T. mexicana* is readily separated from the other species in this group by the shapes of the right and left claspers.

***Tenagobia serrata* sp. nov.** (Pl. I, figs. 6, 9.)

Size: Length, male 2.55 mm.; female 3.-3.1 mm. Width of head, male 1. mm.; female 1.2 mm.

Color: Varies from uniform light brown to variegated dark brown; transparent V-shaped figure near base of each clavus; lateral margins of hemelytra each with 4 dark maculations; slender, transparent, longitudinal line in right hemelytron caudad to claval suture. Venter and legs uniformly yellow.

Structural characteristics: *Head*: The same as in *mexicana* except that caudo-lateral angles of vertex are more acute.

Prothorax: The same as *mexicana*. *Scutellum*: $2\frac{1}{2}$ times wider than long. *Hemelytra*: The same as *mexicana*. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum, and from apex of scutellum to apex of clavus is as 6:6:15:30. *Wings*: Present. *Abdomen*: The shape of tergites and location of the spine-like setae the same as in *mexicana*. *Claspers*: The right with a double row of serratures ventrally, the heel very acute, a deep excavation immediately proximad to it, the toe somewhat produced and rounded. The left rather simple, heel not developed, toe pointed, resembles that of *signata* (White) rather closely. *Legs*: Fore-leg is identical with that of *mexicana* in shape and in the peg and row of spine-like setae on femur, the number of setae on the tarsus differs, however, there being 10 long hair-like setae in the upper row in this species and but 8 in *mexicana*.

Described from a series of 1 male and 8 females bearing the label: Lower Mamore River, December, 1913. Steinbach.

The Lower Mamore River is in central Bolivia north of Santa Cruz.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: This species, as was stated under the discussion of *mexicana*, belongs to the *signata* group. It is readily distinguished from the other members of this group by the double row of serratures on the ventral side and the shape of the right clasper.

Tenagobia constricta sp. nov. (Pl. II, figs. 1, 4, 6, 7, 10, 11.)

Size: Length, male 2.80 mm.; female 3.0 mm. Width of head, male 1.05 mm.; female 1.20 mm.

Color: Uniformly fuscous brown above; front and vertex transparent yellowish grey, posterior margin of vertex darker; lateral margins of hemelytra lighter, each with two fuscous maculations. Ventral aspect of thorax yellowish, abdomen darker; legs yellowish, slightly darker at distal ends.

Structural characteristics: *Head*: Posterior margin of vertex sinuate, caudo-lateral angles not produced laterally; an eye $1\frac{1}{4}$ times wider than interocular space; posterior margin of eyes distinctly separated from the posterior margin of the head. *Prothorax*: Moustache-like bristles on lateral margins, cephalic aspect; pronotum a little narrower than head, $6\frac{1}{2}$ times wider than median length, 2 times wider than base of scutellum; posterior margin not truncate in front of bases of hemelytra, narrowed at ends. *Scutellum*: Approximately

$2\frac{1}{2}$ times longer than median length of pronotum, 1 $\frac{1}{5}$ times wider than long. *Hemelytra*: Same shape as those of *T. romani* Lundblad; exceed abdomen about 0.2 mm. in male, slightly in female; membranal sutures both distinct; minute peg-like setae scattered irregularly over the hemelytra; very fine hair-like setae distally; distinct longitudinal impressions on each lateral margin anteriorly, many bristle-like setae in the impressions. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum and from apex of scutellum to apex of clavus is as 50:21:50:135. *Wings*: Present. *Abdomen*: 5th and 6th segments each with two short spine-like setae on each side; 7th segment relatively long, with 2 spine-like setae on each side; 8th segment with 1 lateral and 1 terminal spine-like setae on either side, tergite-tongue rather truncate at end, bearing 15 long hair-like setae. *Claspers*: The right has a membranous basal portion, the distal part shaped somewhat like a sled-runner with a notch about mid-way of dorsal surface; the left with a membranous, hairy cap set on the up-turned distal end. *Legs*: Front long and slender, femur with 2 weak spine-like setae on inner underneath side, 13 bristle-like setae in lower row, about 14 hairs in inner row, 5 long hair-like setae in upper row; tarsal claw very slender. Ratio of lengths of femur, tibia, tarsus and tarsal claws of middle leg is as 62:18:25:15.

Described from a series of 2 males and 14 females bearing the label: F. X. Williams, Tena, Ecuador, Feb. 28, 1923.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: This species is very closely related to *T. romani* Lundblad. They agree in being the only two known species of *Tenagobia* that have such narrow interocular spaces, in the shape of fore-legs, in the number of spine-like setae on fore-femur, in shape of hemelytra, and the dorsal aspect of abdomen. They can be readily distinguished by the shape of the claspers, both of which are distinct; by the fact that *constricta* is uniformly colored and *romani* is not; by the number of bristle-like setae on the lower edge of the fore-tarsus, *romani* has about 22, *constricta* only 13; and in *romani* there are 2 lateral spine-like setae on 8th abdominal segment, in *constricta* only 1.

Tenagobia hungerfordi sp. nov. (Pl. II, figs. 2, 3, 5, 8, 9.)

Size: Length, male 2.85 mm.; female 3.-3.15 mm. Width of head, male 1.05 mm.; female 1.2 mm.

Color: Brownish fuscous above; eyes dark; vertex and front greyish transparent; hemelytra with lateral margins lighter and four dark maculations on each; the usual transparent V-shaped figure at base of each clavus. Yellowish beneath, hind legs darker distally.

Structural characteristics: Head: Posterior margin of vertex without median tubercle, caudo-lateral angles obtuse; an eye slightly narrower than interocular space; posterior margin of eyes widely separated from the posterior margin of head. *Prothorax:* Moustache-like bristles present on lateral margins, cephalic aspect; pronotum about 7 times wider than median length, 4 times wider than posterior margin of vertex, 2 times wider than base of scutellum, posterior margin not truncate in front of bases of hemelytra, narrowed at ends. *Scutellum:* $2\frac{1}{2}$ times as long as median length of pronotum, $1\frac{1}{2}$ times wider than long, apex very acutely angled. *Hemelytra:* Membranes well developed, the left transparent; many minute peg-like setae scattered irregularly over entire hemelytra, numerous fine hair-like setae distally; deep longitudinal impression near each lateral margin in which there is a row of larger setae. Ratio of lengths (dorsal aspect) of head, pronotum, scutellum, and from apex of scutellum to apex of clavus is as 55:20:50:120. *Wings:* Present. *Abdomen:* 5th, 6th, and 7th segments each with 2 spine-like setae on either side, the 5th and 6th tergites excavated on right side and projected on left; 8th segment with 1 lateral and 1 terminal spine-like setae on either side, tergite-tongue bears 11 weak hair-line setae, mesal margin sinuate, right half of segment with a tuft of short bristle-like setae on mesal margin near the caudal end. *Claspers:* The left with a brown pointed projection near the base somewhat as in *melini* and *schadei* Lundblad but is more pointed, the distal end is upturned; in the right the distal end is bent up nearly at right angles to the basal part, ventrally there is a papilla-like projection. *Legs:* Fore-leg with a row of 6 spine-like setae on inner underneath side of femur; tarsus large, longer than tibia, 12 bristle-like setae in lower row, 13 hairs in inner row, 6 long hair-like setae in upper row. Middle leg, ratio of lengths of femur, tibia, tarsus, and tarsal claws is as 155:55:60:45.

Described from a series of 1 male and 9 females bearing the label: Corumba, Matto Grosso, Brazil, Dec. 14-22, 1919. R. G. Harris.

Holotype male. All types in the University of Kansas Entomological collection.

Comparative notes: This species is close to *melini* and *schadei* Lundblad. It differs from *melini* in the shape of claspers, in that it has but 12 bristle-like setae in lower row on fore-tarsus while *melini* has 18, and in that it has 2 spine-like setae on each lateral margin of 6th abdominal segment instead of 1 as *melini* has. It is at once distinguished from *schadei* by the fact that *schadei* has no minute peg-like setae on the hemelytra. The two species are further distinguished by the shape of the claspers, and in that *schadei* has but 5 hair-like setae in the upper row on the fore-tarsus while *hungerfordi* has 6.

This species is named for Dr. H. B. Hungerford, of the University of Kansas.

PLATE IX.

1. Left clasper, *Tenagobia minuta* sp. nov.
2. Left clasper, *T. mexicana* sp. nov.
3. Right clasper, *T. mexicana*.
4. Right clasper, *T. minuta*.
5. Left clasper, *T. truncata* sp. nov.
6. Left clasper, *T. serrata* sp. nov.
7. Left part of 8th abdominal segment, *T. truncata*.
8. Head and pronotum, *T. truncata*.
9. Right clasper, *T. serrata*.
10. Left part of 8th abdominal segment, *T. minuta*.
11. Inner side of right fore-leg, *T. truncata*.
12. Inner side of left fore-leg, *T. mexicana*.
13. Left part of 8th abdominal segment, *T. mexicana*.
14. Inner side of left fore-leg, *T. minuta*.

PLATE X.

1. Left clasper, *Tenagobia constricta* sp. nov.
2. Right clasper, *T. hungerfordi* sp. nov.
3. Left clasper, *T. hungerfordi*.
4. Right clasper, *T. constricta*.
5. Head, *T. hungerfordi*.
6. Left part of 8th abdominal segment, *T. constricta*.
7. Head, pronotum and scutellum, *T. constricta*.
8. Left part of 8th abdominal segment, *T. hungerfordi*.
9. Inner side of right fore-leg, *T. hungerfordi*.
10. Inner side of left fore-leg, *T. constricta*.
11. Tarsal claw, *T. constricta*.



